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AUTHOR Guyton, John William, III
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ABSTRACT

This document reports on a study designed to determine if there are significant identifiable differences in personality traits of outstanding, regular, and provisional secondary science teachers in Mississippi. Combinations of factors that differentiated the three groups were also investigated. The scores of typical outstanding science teachers indicated that they were fast learners and quick to grasp new ideas. They tended to be tough, self-reliant, realistic, independent, and "down to earth." Outstanding teachers appeared to be self-assured, confident, and accustomed to going their own way. Group characteristics were determined to include resourcefulness and a preference for making their own decisions. Their scores also indicated that they were venturesome and socially bold. However, they also indicated a tendency to be serene and careless of detail. (TW)

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A COMPARISON OF THE PERSONALITY TRAITS OF SECONDARY SCIENCE TEACHERS IN MISSISSIPPI PUBLIC SCHOOLS

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BY

JOHN WILLIAM GUYTON III

PRESENTED AT THE ANNUAL MEETING OF THE
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The purpose of this study was to determine if there were significant identifiable differences in the personality traits (16 Personality Factors) of outstanding, regular, and provisional secondary science teachers in Mississippi. Combinations of factors that differentiated the three groups were also investigated.

The population for this study was approximately 2,300 secondary science teachers in Mississippi during the 1984-86 school years. Participation was solicited from three subgroups. All teachers nominated for the Presidential Award for Excellent Science Teaching, a random sample of regularly certified secondary teachers of science, and all provisionally certified teachers of science were invited to participate. A letter requesting participation and a postcard were sent to each subject. Upon receipt of the postcard a short biographical questionnaire and Cattell's 16 Personality Factor Questionnaire was mailed to each participant.

Prior to testing the hypotheses some descriptive data were analyzed to identify any background differences between the three groups. Chi-square techniques were used to identify any differences between the three groups on the attribute variables gender, race, age, level of education, and years teaching experience. The only significant

difference between the three groups on background variables were found in the age and years of teaching experience variables (see Table 1). The outstanding teacher group was significantly older and more experienced than the regular teacher group. No significant differences existed between the regular and provisional groups on the maturation variables of age and experience.

Insert Table 1

The first hypothesis stated there would be no significant difference in the personality traits of the three groups as measured by each independent factor of Cattell's 16 Personality Factor Questionnaire.

The first hypothesis was tested by univariant analysis of variance and was reported in Table 2. Factor B (concrete-thinking vs. abstract-thinking) was the only factor to show significance. An F-ratio of 5.18 with 2 and 71 degrees of freedom was significant at the .01 level. To determine precisely where the difference was the Scheffe test was used. The outstanding and regular group means were found to be significantly different at the .05 level (see Table 3). No significant differences were found between the provisional and outstanding group means. This, according to Cattell et al. (1970), indicated the

outstanding teachers were more abstract in their thinking than the provisional teachers.

Insert Tables 2 and 3

The second hypothesis stated that no combination of the 16 Personality Factors would discriminate significantly between the outstanding and regular groups. The provisional group was omitted from this analysis because of the small group size, 10 subjects.

Discriminate analysis was performed to differentiate between regular and outstanding teachers. As shown in Table 4, a canconical correlation of .52 was derived with a Wilks' Lambda of .73. This computation yeilded a Chi-square value of 18.78 with 6 degrees of freedom which is significant at the .01 level. These data indicated a significant difference in the personalities of the outstanding and regular groups of teachers.

Insert Table 4

In Table 5 the six variables that differentiated the two groups were given. The standardized discriminant coefficients indicated the degree each variable influenced the differences between the two groups. The most

discriminating variable was B (general intelligence), followed by I (premsia), Q2 (self-sufficiency), O (guilt proneness), H (parmia), and G (character).

A positive loading on Factor B of .972 represented a significant difference between outstanding and regular teachers. Outstanding teachers were more abstract thinking, quicker to grasp ideas, and faster learners than were regular teachers according to Cattell's description of a positive loading on Factor B.

Insert Table 5

The second highest loading was associated with Factor I. Outstanding teachers were determined to be more tough minded than regular teachers. The outstanding teachers' means indicated that they would exhibit realistic, "down to earth," independent, and responsible characteristics. A high loading on Factor I was typical of group members who would keep the group on task on a practical and realistic basis. The regular teachers' scores indicated that they tended to be more tender minded, emotionally sensitive, day dreaming, artifically fastidious and fanciful.

Outstanding teachers scored higher on Factor Q2 which indicated they would be more self sufficient and resourceful than regular teachers. The outstanding teachers' scores indicated characteristics including being

temperamentally independent, accustomed to going their own way, and hesitant to ask others for help. The regular teachers' mean scores indicated they were more inclined to be group joiners prefering to make collective decisions and were dependent on approval and admiration.

On Factor O, weighting placid versus apprehensive, the outstanding teachers were described as more self-assured, confident, and serene in contrast to the apprehensive, worrying characteristics displayed by the regular teachers of science group.

A positive loading on Factor H indicated the outstanding teachers were venturesome, socially bold, uninhibited, and spontaneous. The regular teachers' scores indicated they were more restrained, timid, cautious, and shy.

The influential factor of least significance was Factor G. A positive loading on Factor G indicated stronger super-ego strength on the part of the outstanding teachers. This trait included characteristics like conscientiousness, perseverving, and ruleboundness. The regular teachers group characteristics included being more expedient, disregarding rules, and feeling fewer obligations.

The scores of typical outstanding science teachers indicated they were fast learners and quick to grasp new ideas. They were typically tough, self-reliant, realistic, independent, and "down to earth." Outstanding teachers

appeared to be self-assured, confident, and accustomed to going their own way. Group characteristics were determined to include resourcefulness and a preference for making their own decisions. Their scores also indicated they were venturesome and socially bold; however, they may tend to be serene and careless of detail. According to Cattell's (1970) interpretation of the factor loadings, outstanding teachers were relatively pushy and temperamental. The typical outstanding teacher was persevering, proper, moralistic, rule-bound, and preferred hardworking people to witty companions.

The results of this study were in relative agreement with the results of studies by Handley and Bledsoe (1967), McClain (1968), Meosky (1967), Roper (1976), and Cattell et al. (1970). A review of the commonalities of these studies is reported by Guyton (1987).

Table 1.

Comparison of the Three Groups on Age and Experience

	Outstanding			Regular			Provisional			df	F-Ratio
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD		
Age	37	44.95	8.5	27	39.37	9.63	10	35.7	9.36	2	5.48*
Experience	37	18.65	8.1	27	14.30	7.99	10	7.6	7.67	2	7.99*

* $P < .05$

Table 2.

Differences in Personality Traits Among Outstanding, Regular, and Provisional Science Teachers

	Outstanding			Regular			Provisional			F
Factors	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	
A	37	10.84	3.50	27	11.22	2.24	10	9.60	2.50	1.09
B (a)	37	9.54	1.76	27	8.04	1.81	10	9.00	2.26	5.18*
C	37	16.84	3.50	27	15.67	3.79	10	17.10	3.25	1.03
E	37	11.97	4.49	27	11.11	3.73	10	11.70	3.74	.341
F	37	12.76	4.43	27	11.70	4.14	10	13.50	2.84	.855
G	37	14.8	3.06	27	14.56	2.82	10	16.00	2.75	.902
H	37	13.76	6.46	27	12.67	4.60	10	14.10	5.36	.370
I	37	9.97	3.64	27	11.15	3.23	10	10.70	2.95	.946
L	37	6.73	2.7	27	6.41	3.52	10	5.90	2.89	.311
M	37	11.95	3.70	27	10.11	2.97	10	11.30	4.27	2.11
N	37	9.38	2.70	27	10.59	2.87	10	8.30	3.27	2.78
O	37	10.03	3.84	27	10.33	4.81	10	10.90	4.89	.165
Q1	37	6.87	2.82	27	6.26	3.56	10	6.50	3.14	.294
Q2	37	12.84	3.41	27	11.70	3.06	10	12.10	2.33	1.031
Q3	37	14.92	2.63	27	14.30	2.55	10	15.00	3.13	.496
Q4	37	12.95	5.69	27	13.26	5.07	10	13.80	5.07	.104

* p<.01 (4.93).01

(a) Results of Scheffe' Test OT>RT, others are equal.

Table 3.

Results of Scheffe' Test Comparing Means on Factor B for Three Groups

Group Means		
Regular Teachers	Provisional Teachers	Outstanding Teachers
8.04	9.00	9.54

Means not joined by a common line are significantly different at the .05 level.

Table 4.

Results of Discriminant Analysis Differentiating Between Regular and Outstanding Teachers

Variables in Set	Canonical Correlations	Wilks' Lambda	df	X^2	p
6	.52	.73	6	18.78	.01

Table 5.

Variables Discriminating Between Regular Teachers and Outstanding Teachers

Factors	Outstanding		Regular		Standardized Discriminant Coefficients
	$\bar{X}$	SD	$\bar{X}$	SD	
B	9.54	1.76	8.04	1.81	.972
G	14.81	3.06	14.56	2.82	.2638
H	13.76	6.46	12.67	4.61	.4158
I	9.97	3.64	11.15	3.23	.5336
O	10.03	3.84	10.33	4.81	.4164
Q2	12.84	3.41	11.70	3.06	.4231

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